Attachment 4
Project Description

4.1 Enhanced Groundwater Recharge Study - Project Description

Based on input and direction received from the Basin Advisory Panel and Technical Advisory Committee, the Water Agency proposes this project to construct groundwater monitoring wells and collect geologic, hydrogeologic and groundwater quality data to support and further evaluate the feasibility of enhanced recharge techniques, including Aquifer Storage and Recovery (ASR, using wells) of wintertime Russian River water and recharge (infiltration) of local stormwater, in Sonoma Valley, California.

The proposed project, named the Sonoma Valley Enhanced Groundwater Recharge Study (Enhanced Groundwater Recharge Study), will include the following specific elements:

1. Construction of two multi-level (or nested) groundwater monitoring wells: one well in a localized area of groundwater level decline which will also be used for monitoring during the aquifer test (see number 2 below), and the other well in an area of saline water intrusion;
2. Performance of an aquifer test using an existing inactive municipal supply well to initially assess ASR feasibility;
3. Geochemical modeling of water quality and aquifer matrix geochemistry to assist in designing an aquifer storage and recovery pilot study;
4. Construction of four shallow groundwater monitoring wells to evaluate potential sites for stormwater recharge projects.

The Enhanced Groundwater Recharge Study is part of a logical and incremental progression of study, analysis, and collaboration in the Sonoma Valley in an effort to implement the Sonoma Valley GWMP, which was prepared in 2007 by a broad coalition of local stakeholders. Among other recommendations, the GWMP identifies groundwater recharge through both groundwater banking of winter Russian River supplies through ASR in addition to infiltration of local stormwater as a primary strategy to enhance the sustainability of the Sonoma Valley Groundwater Basin. The Enhanced Groundwater Recharge Study will provide data required to further assess the feasibility of groundwater recharge through both ASR of Russian River water and infiltration of captured stormwater. In addition, the Enhanced Groundwater Recharge Study will increase the monitoring of groundwater conditions (water level and quality) associated with areas of declining groundwater levels and potential saline water intrusion. Currently there are a limited number of dedicated monitoring wells in Sonoma Valley available

for monitoring. Work associated with the proposed project would more than double the number of dedicated monitoring wells available for monitoring in Sonoma Valley.

Expanding Hydrogeologic Information

The nested groundwater monitoring wells will be geophysically logged and constructed at two locations where there is very little hydrogeologic information available, in areas where saline water intrusion is a concern, and in or very near areas of groundwater depression due to localized pumping, in order to better understand aquifer characteristics and for planning. The well-sites have been chosen to further evaluate the potential for constructing enhanced recharge facilities (ASR and infiltration) in these areas. These new wells will be incorporated into the basin-wide groundwater monitoring network shown on Figures 4-1 and 4-2 and will provide continued information on the groundwater quality, levels, and gradients.

A 72-hour constant rate aquifer test will be conducted in an existing inactive water supply well. The aquifer test will be used to preliminarily assess the aquifer for ASR, and to further evaluate the inactive water supply well as an ASR well. The nested well at the Sonoma Garden Park location will be used to monitor groundwater levels during the proposed aquifer test, and lithologic samples collected during drilling of the borehole will be analyzed to assess aquifer matrix geochemistry and used in geochemical modeling to support a future aquifer storage and recovery pilot study.

Four shallow groundwater monitoring wells will be installed at specific sites identified in a separate scoping study (see Section 4.3) to evaluate the potential for surface infiltration of captured stormwater. Detailed Lithologic information will collected during drilling to assess the feasibility of surface infiltration and groundwater level monitoring will be used to document depth to groundwater and any barriers to infiltration.

The Enhanced Groundwater Recharge Study will help advance two of the primary strategies for sustaining groundwater resources in Sonoma Valley identified by local stakeholders in the Sonoma Valley Groundwater Management Plan:

1. Groundwater Banking through Aquifer Storage and Recovery
2. Stormwater Capture and Recharge

The Enhanced Groundwater Recharge Study will build upon the findings of ongoing studies recommended by the plan, including a Groundwater Banking Feasibility Study and a Scoping Study for Stormwater Management and Groundwater Recharge (see Section 4.3).

The proposed project will also build upon work accomplished between 2009 and 2011 under a previous LGA grant in which two nested monitoring wells were installed and a groundwater recharge mapping project was successfully completed. For example, the results of the two nested monitoring well installations have been used to further assess saline water intrusion and to site the location of the two new nested wells in this proposed project. Additionally, the results of the recharge mapping project are being used to identify areas to investigate stormwater recharge, an important component of the Enhanced Groundwater Recharge Study.

Technical work to date strongly suggests that the existing field data and the groundwater model need to be augmented substantially before proceeding to implement significant capital projects aimed toward helping to sustain this resource by increasing groundwater recharge. Thus it is important that the data gathering and analysis efforts under this proposed Enhanced Groundwater Recharge Study take priority so that a better understanding of the parameters and dynamics of the existing resource can be developed.

The proposed project will provide a definite and achievable quantity of new knowledge and improvement in groundwater management by developing hydrogeologic information needed to move forward with enhanced recharge pilot projects in Sonoma Valley and by more than doubling the number of dedicated monitoring wells available for monitoring. The need for both groundwater banking and stormwater recharge were identified by the BAP through groundwater modeling as necessary components for bringing the groundwater basin into balance (in addition to recycled water and water conservation). The modeling predicted that of a simulated incremental increase in storage over a 30-year period of 27,300 acre feet, groundwater banking and stormwater recharge could make up approximately 70 percent of this total.

Broad Support for the Proposed Project

The Enhanced Groundwater Recharge Study has been developed with the input and approval of the Sonoma Valley Basin Advisory Panel. Letters of endorsement from the entities listed below appear at the end of this attachment.

- San Francisco Bay Regional Water Quality Control Board
- Valley of the Moon Water District
- Sonoma Ecology Center
- City of Sonoma
- Southern Sonoma County Resource Conservation District

4.2 Objectives of the Project

The objectives of the Enhanced Groundwater Recharge Study are as follows:

1. To further assess the feasibility of aquifer storage and recovery using wintertime Russian River water and local stormwater infiltration as techniques for enhancing groundwater recharge in the Sonoma Valley;
2. To further assess and monitor groundwater levels and water quality in the southern Sonoma Valley in localized areas of groundwater level declines and where potential saline water intrusion is a concern;
3. To improve the groundwater-level and groundwater quality monitoring network in Sonoma Valley, which will help meet the objectives for the California Statewide

Groundwater Elevation Monitoring (CASGEM) program and Salt and Nutrient Management Planning being undertaken in Sonoma Valley;

4. To improve the understanding of hydrostratigraphic conditions in southern Sonoma Valley.

4.3 Background and Relation of the Project with Groundwater Management Program and Associated Studies

The Sonoma Valley groundwater basin, located in Sonoma County, California, has been experiencing increasing stresses on its groundwater resources in recent years due to population growth and land-use changes. The basin's water demands are met by a combination of imported water and native groundwater, supplemented in recent years by recycled water and expanding water conservation programs. Groundwater meets more than half of the water demand in the Sonoma Valley, with irrigation being the largest use drawing on an estimated more than 70 percent of the annual groundwater demand.

The area of the Sonoma Valley Groundwater Management Plan (GWMP) consists of the entire Sonoma Creek Watershed (Sonoma Valley) and encompasses the Sonoma Valley groundwater subbasin (DWR basin 2-2.02) and portions of the Kenwood Valley groundwater basin (DWR basin 2-19) within DWR's North Central Region. The Kenwood Valley groundwater basin straddles the Sonoma Creek and the Laguna de Santa Rosa watersheds. The Sonoma Valley is approximately 166 square miles in size, and is bounded by the Sonoma Mountains to the West, the Mayacamas Mountains to the east and north, and San Pablo Bay to the South.

The current understanding of the groundwater resources in the basin comes primarily from a study conducted by the United States Geological Survey (USGS) which was co-funded by the Water Agency to evaluate the ground water resources of the Sonoma Valley (USGS, 2006) and subsequent studies and monitoring associated with implementing the GWMP. The USGS study, which is part of a phased cooperative study program to evaluate groundwater resources in Sonoma County, updated the hydrogeologic characterization of the basin and assessed hydrologic conditions, including a description of historical groundwater levels and water quality changes. A groundwater flow model was also developed as part of the study that was used to evaluate conjunctive water management options during development of the GWMP. The USGS study identified two primary areas of declining groundwater levels in Sonoma Valley, which are present in the El Verano area and southeast of the City of Sonoma. Subsequent monitoring and studies performed during implementation of the GWMP has better defined these areas and indicate that the declining groundwater levels are primarily associated with deeper aquifer zones in these areas (i.e., greater than 200 feet below ground surface). The USGS study also found that electrical conductivity measurements from wells located in the southern portions of Sonoma Valley exhibited increases over time, potentially due to saline water intrusion and/or upwelling of geothermal waters. Groundwater levels in some these areas range up to 100 feet below sea level, which can potentially cause additional saline water intrusion.

Geologic and Hydrogeologic Conditions

Sonoma Valley is located within a geologically complex region. The entire watershed is underlain by basement rocks consisting of the Franciscan Complex, Coast Range ophiolite, and Great Valley Sequence metamorphic rocks, metasediments, volcanic and igneous rocks. A mixture of younger volcanic and sedimentary rocks and unconsolidated sediments overlies these basement rocks. In general, groundwater flows from recharge areas in the mountains and uplands surrounding the Sonoma Valley toward the valley axis and in a generally southern direction towards San Pablo Bay. Several faults have been mapped in these mountains and one prominent northwest-striking fault has been mapped along the eastside of the valley floor. This fault, referred to as the Eastside Fault, may act as a conduit for the upward circulation of deeper thermal waters in the Sonoma area, and may restrict groundwater flow (USGS, 2006).

All geologic formations in the Sonoma Valley contain groundwater; however the water-bearing properties and well yields of the formations vary significantly. Four geologic units are identified as part of the basin fill that are of greatest importance for groundwater supply in Sonoma Valley (USGS, 2006). These units are the Quaternary alluvial deposits, the Glen Ellen Formation, Huichica Formation, and Sonoma Volcanics. The shallow portions of the Quaternary alluvial deposits are commonly unconfined, while deeper portions of the Quaternary alluvial deposits, the Glen Ellen Formation, Huichica Formation, and Sonoma Volcanics are commonly confined to semi-confined. These geologic units overlay the basement rocks of the Franciscan Complex, which for the most part acts as a barrier to flow, but can yield water near fault zones or where heavily fractured (USGS, 2006).

Groundwater Quality

On the basis of groundwater quality sampling and analysis conducted by the USGS, overall groundwater is generally of good quality, and acceptable for potable use. However, wells having water quality of higher values equal to or in excess of standards and advisory levels for arsenic, boron, iron, manganese and total dissolved solids were detected. High salinity waters were also detected in the Sonoma Valley, primarily in the southern end, and may be associated with potential seawater intrusion or connate groundwater. Additionally, there is an indication of an upwelling of the geothermal water beneath the east side of the valley through fractures and faults along the margin of the Bay Mud deposits.

Water Balance and Water Supply

The USGS study estimated that pumping in the Sonoma Valley has generally increased from approximately 6,200 acre-feet per year in 1974 to 8500 acre-feet per year in 2000, a 37 percent increase in pumping. The USGS also estimated on the basis of groundwater flow modeling, that during the period 1975 to 2000, 17,300 acre-feet were lost from overall groundwater storage. The increased pumping over time and estimated groundwater storage loss in the Sonoma Valley is expressed as localized declining groundwater levels in some areas, and potential groundwater quality problems from saline water intrusion and geothermal upwelling.

The Sonoma Valley relies on groundwater and imported surface water to meet domestic, agricultural and urban demands. Based on the 2006 USGS study, in the year 2000 more than half the water demand was met with groundwater (57 percent), followed by imported water (36 percent), with the remaining demand met from recycled water (7 percent) and local surface water not which was not quantified. Groundwater is the primary source of supply for approximately 25 percent of the Sonoma Valley population, and is the sole source of drinking water supply for rural domestic and other unincorporated areas not being served by urban suppliers. Rural domestic demand is met by groundwater extracted from privately owned and operated wells. There are also mutual water companies in the Sonoma Valley that supply domestic water to multiple households mainly with groundwater, although some companies also use imported water. Agricultural water demands are largely met by Sonoma Valley groundwater supplies.

Enhanced Recharge Approach & Relation of Proposed Project to GWMP and Other Studies

Among other recommendations, the GWMP identifies increasing groundwater recharge through groundwater banking and stormwater recharge as two of the four primary strategies to enhance the sustainability of the Sonoma Valley Groundwater Basin. As part of implementing the strategies identified in the GWMP and in order to take advantage of regional partnerships, Water Agency has embarked on several studies which will be further advanced by the proposed project, including:

1. Groundwater Banking Feasibility Study: To improve the reliability of future water supplies (both surface water and groundwater), the Water Agency partnered with the City of Sonoma and Valley of the Moon Water District (in addition to the Cities of Cotati, Rohnert Park and the Town of Windsor in the Santa Rosa Plain Groundwater Basin) to conduct a feasibility study for a regional groundwater banking program, as recommended in the GWMP. The groundwater banking feasibility study is investigating the viability of conjunctively managing surface water and groundwater resources through the diversion and transmission of surplus Russian River water produced at the Water Agency's existing production facilities for storage in the Sonoma Valley Groundwater Basin (in addition to the Santa Rosa Plain Groundwater Basin during wet weather conditions (i.e., the winter and spring seasons) for subsequent recovery and use during dry weather conditions (i.e., the summer and fall seasons) or emergency situations. In addition to addressing specific local needs in Sonoma Valley, several regional potential benefits may be realized by incorporating a water management strategy that more closely matches the natural hydrologic cycle into the region's water-supply portfolio. These potential benefits include:
    - Integration of water-supply sources to enhance the overall reliability and adaptability of regional water resources to address periods of peak seasonal use, drought conditions, and potential long-term climate changes, which are anticipated to include increased seasonality of weather conditions.

- Reduction of fisheries impacts related to elevated summer flows in Dry Creek by reducing the need for such flows in Dry Creek, given that a portion of the peak demand could be met with a groundwater banking program.
- Increasing the ability of the regional water supply to withstand natural hazards by further distributing portions of the regional water supply to areas other than the Water Agency's existing water production facilities.
- Aligning the region's water resource management actions with State policies and programs by integrating water supplies and employing conjunctive use strategies.

The proposed project will advance the groundwater banking feasibility study by collecting geologic data, water quality data, aquifer property estimates and performing geochemical modeling to further assess the feasibility of aquifer storage and recovery, which has been identified as one of the more viable techniques for groundwater banking in Sonoma Valley.

2. Stormwater Management & Groundwater Recharge Scoping Study: The GWMP identifies stormwater recharge as a key action towards achieving groundwater sustainability in Sonoma Valley. Following on this recommended action in the GWMP, scoping studies for projects within Water Agency flood control zones that reduce flooding and increase groundwater recharge have been initiated in Sonoma Valley (in addition to the Laguna de Santa Rosa and Petaluma Valley watersheds). The goal of the Sonoma Valley Stormwater Management and Groundwater Recharge Scoping Study is to develop one or more stormwater management/groundwater recharge projects that address the Key Project Purpose: reducing flood hazards and increasing opportunities for groundwater recharge within the Sonoma Creek watershed. Other project benefits that are being considered include: improving water quality, ecosystem improvements, preservation of open space and agricultural lands, enhancing recreation, public access and educational opportunities. **The proposed project will advance this study by collecting geologic data and depth to groundwater information to further assess the practicality of performing stormwater recharge at several locations which appear favorable based on analyses completed during the scoping study to date.**
3. Groundwater-Level and Groundwater Quality Monitoring: Substantial improvements to groundwater monitoring in Sonoma Valley have been made in the process of implementing the GWMP. These improvements include: (1) expanding the Voluntary Groundwater-Level Monitoring Program to include the semiannual monitoring of approximately 140 wells; (2) constructing two nested groundwater monitoring wells and instrumenting those wells with submersible pressure transducers through a previous LGA grant; (3) instrumenting several additional wells in Sonoma Valley with submersible pressure transducers; (4) establishing an appropriate monitoring network for DWR's CASGEM program; and (5) conducting groundwater quality sampling with DWR support. In addition to the specific goals of the monitoring program identified in the GWMP, the expansion of groundwater-level and groundwater quality monitoring in Sonoma Valley will also support statewide initiatives including DWR's CASGEM program and groundwater monitoring associated with Salt and Nutrient Management Planning of the SWRCB Recycled Water Policy **The proposed project**

will advance these efforts by filling data gaps and providing long-term dedicated monitoring wells for groundwater-level and groundwater quality monitoring.

4. Upgrade and Update of Groundwater Flow Model: The GWMP identifies updating and maintaining the groundwater flow model as an important action. The original MODFLOW model developed by the USGS was updated in 2008 as part of a masters project (Bauer, 2008) and the Water Agency has recently contracted with the USGS to begin an additional update of the MODFLOW model. The update will expand the boundaries of the model to incorporate the entire watershed (to prepare future development of a fully-coupled surface water/groundwater flow model), further refine hydrostratigraphic layering and update groundwater-level and surface water/groundwater interaction data. **Integrating hydrostratigraphic, aquifer property, and groundwater-level data obtained by the proposed project will support and improve the update of the groundwater flow model, which is currently underway..**

4.4 Project Location

The proposed two new nested groundwater monitoring well sites are shown in Figures 4-1 and 4-2, and are located (1) at the Sonoma Garden Park (near City Well 7) at 19996 Seventh Street East in Sonoma Valley on property owned by the City of Sonoma within the central portions of a groundwater pumping depression and (2) in a public right of way located near the intersection of Highway 121 and Broadway Avenue in the southern portion of Sonoma Valley in an area where sea water intrusion is a concern. The proposed shallow groundwater monitoring wells are located within public right-of-ways or on lands owned by the County of Sonoma Open Space and Agricultural Preservation District in areas where the results of a screening evaluation indicate that opportunities for stormwater recharge projects exist.

Both the City of Sonoma and the County of Sonoma Open Space and Agricultural Preservation District are active members of the Sonoma Valley Groundwater Management Program Basin Advisory Panel and have been part of the planning and discussions surrounding the proposed project. Water Agency will prepare and execute Right of Entry agreements with both parties as part of the Project Work Plan (see Attachment 5).

Figure 4-1. Groundwater Level Monitoring Network (Shallow and Nested Wells)

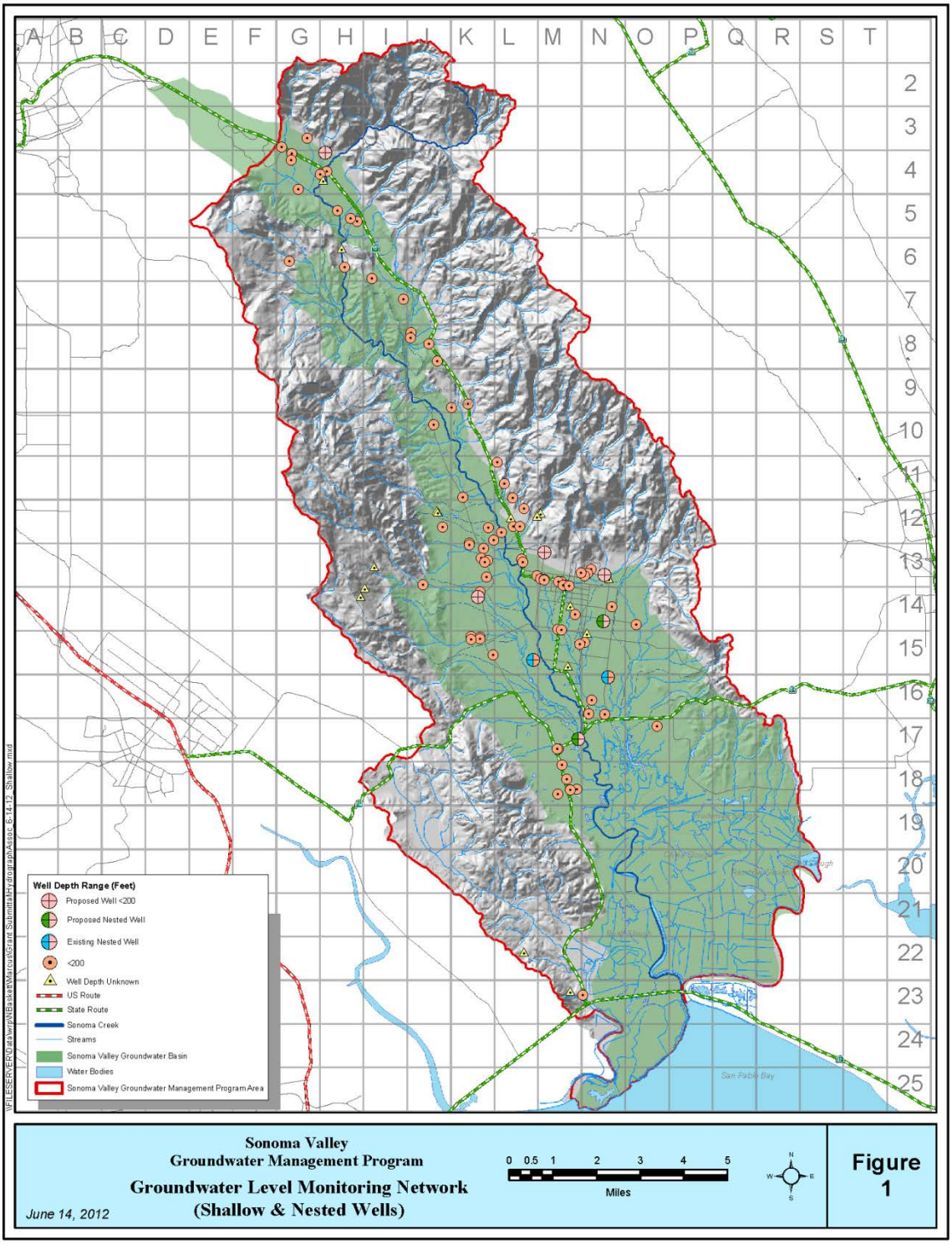
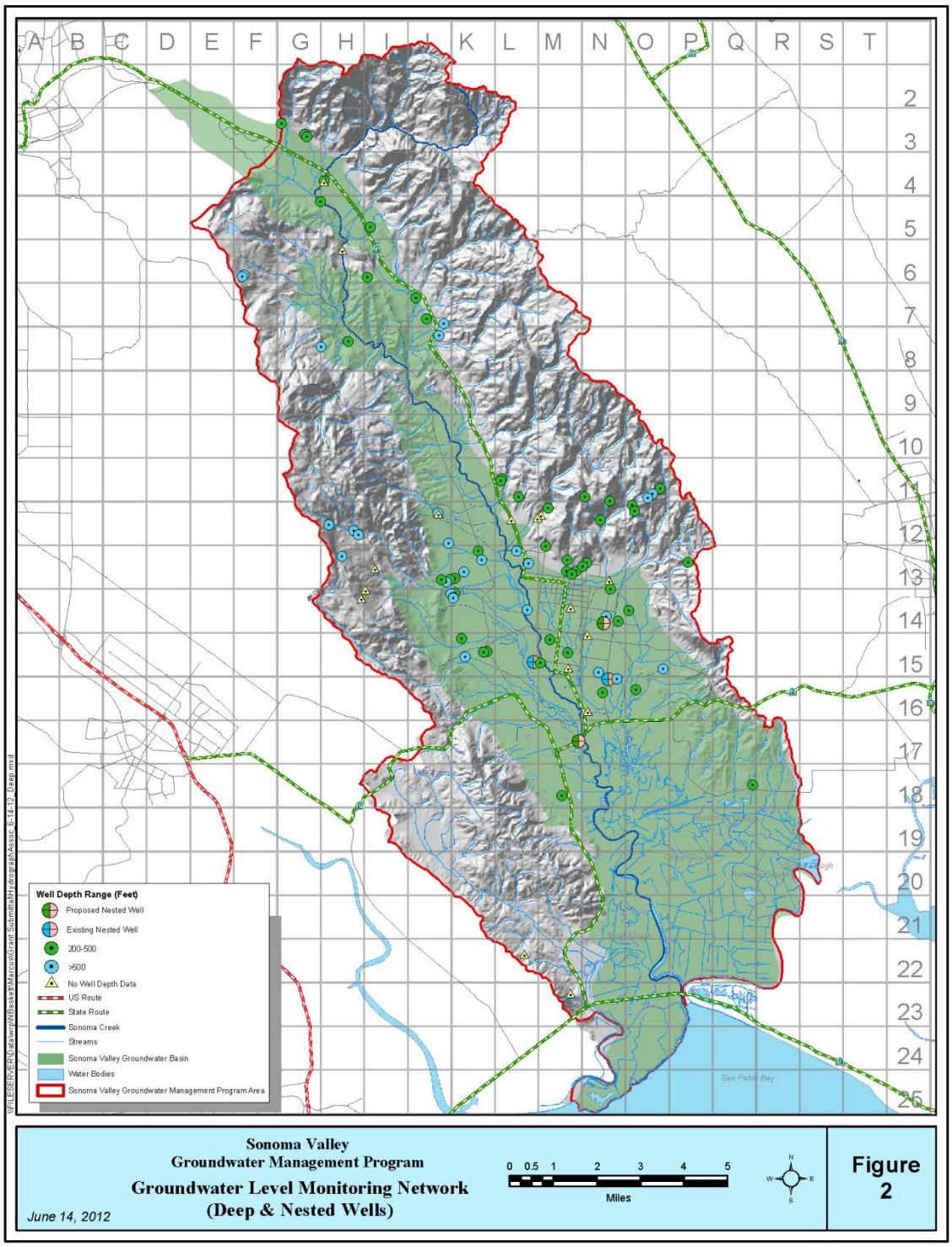


Figure 4-2. Groundwater Level Monitoring Network (Deep and Nested Wells)



4.5 Project Support of GWMP Goals and Objectives

As described in Attachment 3, a non-regulatory Groundwater Management Plan (GWMP) was adopted in 2007 for Sonoma Valley under the authority of the Groundwater Management Act, California Water Code (Water Code) § 10750 *et seq*. The proposed project supports the stated goal of the GWMP:

> *"…To locally manage, protect, and enhance groundwater resources for all beneficial uses in a sustainable, environmentally sound, economical, and equitable manner for generations to come."*

Basin Management Objectives (BMOs)

The GWMP contains the following ten Basin Management Objectives (BMOs) developed by the Basin Advisory Panel, which provide the foundation for achieving the Plan's goal. The proposed project also supports several of the GWMP's BMOs:

- BMO-1 Maintain groundwater elevations for the support of beneficial uses of groundwater and to protect against inelastic land subsidence.
- BMO-2 Improve water use efficiency and conservation.
- BMO-3 Identify and protect groundwater recharge areas and enhance the recharge of groundwater where appropriate.
- BMO-4 Manage groundwater in conjunction with other water sources.
- BMO-5 Protect groundwater quality for beneficial uses including minimizing saline intrusion.
- BMO-6 Protect against adverse interactions between groundwater and surface water flows.
- BMO-7 Improve the community's awareness of groundwater planning, water resources, and legal issues.
- BMO-8 Improve the groundwater database and basin understanding through consistent monitoring and additional surveys, and improve basin analytical tools including the groundwater simulation model.
- BMO-9 Manage groundwater with local control.
- BMO-10 Explore, identify and maximize non-regulatory approaches to manage the groundwater resource.

Correlation between BMOs and Project Goals

The goals of the proposed project, re-stated below, support the goal of the GMWP by meeting the related BMOs:

1. Further assess the feasibility of aquifer storage and recovery using wintertime Russian River water and local stormwater recharge as techniques for improving groundwater management in the Sonoma Valley (**BMO-3 and BMO-4**)

2. Further assess and monitor water quality in the southern Sonoma Valley in an area where potential saline water intrusion is a concern (**BMO-5 and BMO-6**)
3. Improve the groundwater-level and groundwater quality monitoring network in Sonoma Valley, which will help meet the objectives for the California Statewide Groundwater Elevation Monitoring (CASGEM) program and Salt and Nutrient Management Planning being undertaken in Sonoma Valley (**BMO-4, BMO-5, BMO-6 BMO-8**)
4. Improve the understanding of hydrostratigraphic conditions in southern Sonoma Valley (**BMO-8**)

4.6 Quality and Usefulness of the Information Obtained.

The proposed project is designed to collect additional, high value data required for assessing the potential for enhanced groundwater recharge the Sonoma Valley. High quality and useful information will be obtained from the proposed project that will be instrumental in further assessing the feasibility and scoping enhanced recharge projects, which are identified in the GWMP, as key strategies for sustaining groundwater resources in Sonoma Valley. Information from the proposed project will also be valuable in further defining and monitoring areas of declining groundwater levels and salinity intrusion. Groundwater level and water quality data, including chloride, total dissolved solids and general minerals will be collected from the new wells. These data will greatly assist in understanding the specific depth of and extent of saline water intrusion, and hydrogeology and groundwater flow in the southern portion of the Sonoma Valley basin. This will also help to better understand the groundwater budget in the basin, by better understanding groundwater flows, trends and quality. This new information will be incorporated into the Sonoma Valley data management system and in the modified groundwater flow model, and will be used by the Basin Advisory Panel to prioritize and plan for future activities to achieve the GWMP's goal and objectives.

As in the 2008 LGA grant project, monitoring wells be installed using industry standard methodologies, with a California licensed driller and field activities will be conducted under the supervision of a California Certified Hydrogeologist or Professional Engineer. The actual design of the wells (well screen placement and number of screens per nested well) will be based on geophysical logs to be completed on each borehole. The wells will be drilled by direct mud rotary drilling methods. Care will be taken to maintain an appropriate mud weight and consistency in order to minimize formation invasion. To ensure the wells clean up properly prior to sampling, well development will be completed by a variety of methods including surging with a surge block, pumping and air jetting.

Aquifer testing of City Well No. 7 will provide information on aquifer parameters necessary to properly design a pilot-scale ASR test for that well. City Well No. 7 is located in the pumping depression, which started forming in the area in about 1980 and continues through the present. City Well No. 7 resides in the northern edge of the pumping depression which has an estimated potential storage capacity of about 4,000 to 9,000 acre-feet. The well is currently

not permitted by the California Department of Public Health (CDPH), as the groundwater contains elevated concentrations of total dissolved solids (580 mg/L) manganese (75 mg/L) and boron (6.2 mg/L). The potential utilization of this well as an aquifer storage and recovery well would provide a community benefit should the method prove feasible and render the well functional for water supply purposes. Aquifer testing will be performed following industry standard methods, as described in Attachment 8.

The geochemical modeling will provide information on the potential water quality interactions during future ASR testing, which will be necessary for the design and permitting of the pilot-scale ASR test. The geochemical modeling will be conducted by an experienced geochemical modeler using industry-standard USGS software PHREEQC-2.

4.7 Collaborative Management of the Groundwater Basin.

Collaboration with Other Public Agencies and Processes for Informing Stakeholders and the Public

Active stakeholder involvement forms the foundation for the continued, successful collaborative process of decision-making and actions during GWMP implementation. Stakeholder interests represented on the Panel include economic, agricultural, environmental, local agencies with jurisdiction in Sonoma Valley, land use, residential groundwater users, and special districts, with a broad geographic distribution across the Sonoma Valley. A public outreach plan was developed in 2008 by the Center for Collaborative Policy to guide the process by which stakeholders stay informed about and provide input on the implementation of the GWMP, share information through briefings and the media, and inform the community and other interested parties on GWMP implementation. A website for the GWMP implementation is regularly maintained and contains meeting agendas, meeting notes and groundwater study documents and reports. Additionally, through the GWMP process the Water Agency has joined with local agencies, including the City of Sonoma (City), Valley of the Moon Water District (VOMWD), County of Sonoma, Sonoma County Sanitation District, and the County of Sonoma Agricultural Preservation and Open Space District, to fund GWMP efforts and coordinate on groundwater-related programs and initiatives in Sonoma Valley. Over the nearly five years of implementing the GWMP, over 30 Technical Advisory Committee meetings and 18 Basin Advisory Panel meetings have been held. Through these meetings, which are open to the public, stakeholders have been informed and have provided input on the studies that the proposed project will help advance. Specific meetings where these briefings occurred include:

- Public Stakeholder Meetings for the Stormwater Management & Groundwater Recharge Scoping Study held at the April 21, 2011 and October 20, 2011 Basin Advisory Panel meetings
- Briefings on the Groundwater Banking Feasibility Study at the February 19, 2011 and January 19, 2012 Basin Advisory Panel meetings

- Update on Results of Nested Monitoring Well Installations and Monitoring Program at January 19, 2012 Basin Advisory Panel meeting.

The Water Agency, City, and VOMWD have also been working with the San Francisco Bay Regional Water Quality Control Board (Water Board) to plan for the groundwater banking program and have collaboratively developed a permitting approach for future aquifer storage and recovery pilot-scale testing in Sonoma Valley. The San Francisco Bay Water Board has provided a letter of support for the proposed project included in Section 4.8.

Results and progress of the proposed project would be conveyed to local stakeholders and interested agencies through the ongoing quarterly Basin Advisory Panel and monthly Technical Advisory Committee GWMP meetings. Continued maintenance and monitoring of the groundwater monitoring wells constructed as part of the proposed project would be conducted by the Water Agency under the ongoing implementation of the GWMP.

4.8 Post-Grant Funding Support

The groundwater monitoring wells constructed as part of the proposed project would continue to be maintained and monitored for groundwater levels and groundwater quality as part of the implementation of the Sonoma Valley GWMP. These activities will be funded through the cooperative funding agreement between the Water Agency, City of Sonoma, Valley of the Moon Water District, Sonoma Valley County Sanitation District and the Sonoma County Agricultural Preservation and Open Space District. Data from the monitoring wells will be collected and evaluated by the Water Agency on an annual basis and reported included in annual data transmittal reports for the GWMP.

Letters of Support from the entities listed below appear on the following pages

1. San Francisco Bay Regional Water Quality Control Board
2. Valley of the Moon Water District
3. Sonoma Ecology Center
4. City of Sonoma
5. Southern Sonoma County Resource Conservation District

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR
MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

July 9, 2013
2400.00 (RAL)

Mr. Tom Lutterman
California Department of Water Resources
Division of Integrated Regional Water Management
Regional Planning Branch
PO Box 942836
Sacramento, CA 94236-0001

SUBJECT: Endorsement of the Sonoma County Water Agency Local Groundwater Assistance Grant Application for an Enhanced Groundwater Recharge Study in the Sonoma Valley

Dear Mr. Lutterman:

The Regional Water Board is pleased to provide this letter of support for the Local Groundwater Assistance Grant Application submitted by the Sonoma County Water Agency (SCWA) for an Enhanced Groundwater Recharge Study in the Sonoma Valley.

The Enhanced Groundwater Recharge Study project is part of a logical progression of study, analysis, and collaboration in the Sonoma Valley to implement the Sonoma Valley Groundwater Management Plan (SVGMP), prepared in 2007 by a broad coalition of local stakeholders. Among other recommendations, the SVGMP identifies groundwater recharge through both groundwater banking of winter Russian River supplies in addition to local stormwater, as a primary strategy to enhance the sustainability of the Sonoma Valley Groundwater Basin. In addition, the Enhanced Groundwater Recharge Study will increase the monitoring of groundwater conditions (water level and quality) associated with an area of declining groundwater levels.

The proposed project will build upon work accomplished between 2009 and 2011 under a previous Local Groundwater Assistance grant in which monitoring wells were installed and a groundwater recharge mapping project was successfully completed. For example, the results of the recharge mapping project are being used to identify areas to investigate stormwater recharge, an important component of the Enhanced Groundwater Recharge Study. Technical work to date strongly suggests that the existing field data and the groundwater model need to be augmented substantially before proceeding to implement significant capital projects aimed toward sustaining this resource. Therefore, it is important that the data gathering and analysis efforts under the Enhanced Groundwater Recharge Study take priority so that the SCWA can develop a better understanding of the parameters and dynamics of the existing resource.

JOHN MULLER, CHAIR | BRUCE H. WOLFE, EXECUTIVE OFFICER

1515 Clay St., Suite 1400, Oakland, CA 94612 | www.waterboards.ca.gov/sanfranciscobay

RECYCLED PAPER

Mr. Lutterman - 2 -

The application for a grant to fund 1) increasing groundwater monitoring, and 2) developing a better understanding of recharge in the Sonoma Valley, which will provide data to improve the Sonoma Valley groundwater model, are all sound next steps in the implementation program. Each of these programs is supported by robust stakeholder involvement through the SVGMP.

The Regional Water Board supports the SCWA in seeking financial assistance from the State of California to execute this next step in collaboratively studying and monitoring groundwater recharge in the Sonoma Valley to manage and enhance a sustainable Sonoma Valley Groundwater Basin. The Regional Water Board plans to continue to participate collaboratively in the SVGMP implementation efforts to ensure a sustainable groundwater resource for the future in the Sonoma Valley.

Please contact Ralph Lambert of my staff at (510) 622-2382 or by email at ralambert@waterboards.ca.gov if you have any questions regarding this matter.

Sincerely,

Digitally signed by Stephen Hill
Date: 2012.07.09 11:19:50 -07'00'

Bruce H. Wolfe
Executive Officer

cc: Marcus Trotta, SCWA mtrotta@scwa.ca.gov

VALLEY OF THE MOON WATER DISTRICT
A Public Agency Established in 1962
19039 Bay Street • P.O. Box 280
El Verano, CA 95433-0280
Phone: (707) 996-1037
Fax: (707) 996-7615

June 19, 2012

Mr. Tom Lutterman
California Department of Water Resources
Division of Integrated Regional Water Management
Regional Planning Branch
PO Box 942836
Sacramento, CA 94236-0001

Subject: **Endorsement of the Sonoma County Water Agency Local Groundwater Assistance Grant Application for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley**

Dear Mr. Lutterman:

The Valley of the Moon Water District is pleased to provide this letter of support for the Local Groundwater Assistance (LGA) Grant Application submitted by the Sonoma County Water Agency for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley. This project is part of a logical progression of study, analysis, and collaboration in the Sonoma Valley in an effort to implement the Sonoma Valley Groundwater Management Plan (SVGMP), which was prepared in 2007 by a broad coalition of local stakeholders. Among other recommendations, the SVGMP identifies groundwater recharge through both groundwater banking of winter Russian River supplies in addition to local stormwater as a primary strategy to enhance the sustainability of the Sonoma Valley Groundwater Basin. In addition, the Enhanced Groundwater Recharge Pilot Study will increase the monitoring of groundwater conditions (water level and quality) associated with an area of groundwater depression.

The proposed project will build upon work accomplished between 2009 and 2011 under a previous LGA grant in which monitoring wells were installed and a groundwater recharge mapping project was successfully completed. For example, the results of the recharge mapping project are being used to identify areas to investigate stormwater recharge, an important component of the Enhanced Groundwater Recharge Pilot Study.

Technical work to date strongly suggests that the existing field data and the groundwater model need to be augmented substantially before proceeding to implement significant capital projects aimed toward sustaining this resource. Thus it is important that the data gathering and analysis efforts under the Enhanced Groundwater Recharge Study take priority so that we can develop a better understanding of the parameters and dynamics of the existing resource. The application for a grant to fund 1) increasing groundwater monitoring, and 2) developing a better understanding of recharge in the Sonoma Valley, which will provide data to improve the Sonoma Valley groundwater model, are all sound next steps in the implementation program. Each of these programs is supported by robust stakeholder involvement through the SVGMP.

The Valley of the Moon Water District supports the Sonoma County Water Agency in seeking financial assistance from the State of California to execute this next step in collaboratively studying and monitoring groundwater recharge in the Sonoma Valley to manage and enhance a sustainable Sonoma Valley Groundwater Basin. The Valley of the Moon Water District plans to continue to participate collaboratively in the SVGMP implementation efforts to ensure a sustainable groundwater resource for the future in the Sonoma Valley.

Sincerely,

Krishna Kumar
General Manager

SONOMA ECOLOGY CENTER

June 27, 2012

Mr. Tom Lutterman
California Department of Water Resources
Division of Integrated Regional Water Management, Regional Planning Branch
PO Box 942836
Sacramento, CA 94236-0001

Support Letter for Grant Application from Sonoma County Water Agency for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley

Dear Mr. Lutterman,

Sonoma Ecology Center supports this Grant Application from the Sonoma County Water Agency for an Enhanced Groundwater Recharge Pilot Study in Sonoma Valley.

The Study will expand monitoring of groundwater conditions (water level and quality) in an area of groundwater depression, and provide data to improve the Sonoma Valley groundwater model and lead to more sustainable groundwater management.

The Study is part of a logical progression of study, analysis, and collaboration in Sonoma Valley. The Sonoma Valley Groundwater Management Plan (SVGMP) recommends groundwater recharge through banking of winter Russian River supplies and banking local stormwater. The existing field data and groundwater model need to be augmented substantially before proceeding to implement capital projects. The Study builds on a previous LGA grant in which monitoring wells were installed and groundwater recharge potential was mapped by Sonoma Ecology Center. The mapping highlighted the locations selected for the current proposal.

Sonoma Ecology Center operates Sonoma Garden Park, an educational farm and garden, on six acres of land owned by the city of Sonoma, that includes one of the wells to be used in this proposed project. We support the proposed modifications to the well, because the project contributes to a better understanding of groundwater.

We urge the Department of Water Resources to fund the Study. It is a next step in collaboratively studying and monitoring groundwater recharge in Sonoma Valley. We plans to continue to participate in SVGMP implementation efforts, to ensure a sustainable groundwater resource for our community.

Sincerely,

Richard Dale, Executive Director

Mailing Address • PO Box 1486, Eldridge, CA 95431 • (707) 996-0712
Plaza Office • 20 East Spain St., Sonoma, CA 95476 • fax (707) 996-2452
info@sonomaecologycenter.org • www.sonomaecologycenter.org

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Sonoma Sister Cities:
Aswan, Arab Rebublic of Egypt
Chambolle-Musigny, France
Greve in Chianti, Italy
Kaniv, Ukraine
Patzcuaro, Mexico

July 6, 2013

Mr. Tom Lutterman
California Department of Water Resources
Division of Integrated Regional Water Management
Regional Planning Branch
PO Box 942836
Sacramento, CA 94236-0001

Subject: Endorsement of the Sonoma County Water Agency Local Groundwater Assistance Grant Application for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley

Dear Mr. Lutterman,

The City of Sonoma is pleased to provide this letter of support for the Local Groundwater Assistance Grant Application submitted by the Sonoma County Water Agency for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley. This project is part of a logical progression of study, analysis, and collaboration in the Sonoma Valley in an effort to implement the Sonoma Valley Groundwater Management Plan (SVGMP), which was prepared in 2007 by a broad coalition of local stakeholders. Among other recommendations, the SVGMP identifies groundwater recharge through both groundwater banking of winter Russian River supplies in addition to local stormwater as a primary strategy to enhance the sustainability of the Sonoma Valley Groundwater Basin. In addition, the Enhanced Groundwater Recharge Pilot Study will increase the monitoring of groundwater conditions (water level and quality) associated with an area of groundwater depression.

The proposed project will build upon work accomplished between 2009 and 2011 under a previous LGA grant in which monitoring wells were installed and a groundwater recharge mapping project was successfully completed. For example, the results of the recharge mapping project are being used to identify areas to investigate stormwater recharge, an important component of the Enhanced Groundwater Recharge Pilot Study. Technical work to date strongly suggests that the existing field data and the groundwater model need to be augmented substantially before proceeding to implement significant capital projects aimed toward sustaining this resource. Thus it is important that the data gathering and analysis efforts under the Enhanced Groundwater Recharge Study take priority so that we can develop a better understanding of the parameters and dynamics of the existing resource. The application for a grant to fund 1) increasing groundwater monitoring, and 2) developing a better understanding of recharge in the Sonoma Valley, which will provide data to improve the Sonoma Valley groundwater model, are all sound next steps in the implementation program. Each of these programs is supported by robust stakeholder involvement through the SVGMP.

The City of Sonoma supports the Sonoma County Water Agency in seeking financial assistance from the State of California to execute this next step in collaboratively studying and monitoring groundwater recharge in the Sonoma Valley to manage and enhance a sustainable Sonoma Valley Groundwater Basin. The City of Sonoma plans to continue to participate collaboratively in the SVGMP implementation efforts to ensure a sustainable groundwater resource for the future in the Sonoma Valley.

Sincerely,

Linda Kelly
City Manager

SOUTHERN SONOMA RESOURCE CONSERVATION DISTRICT
1301 REDWOOD WAY, SUITE 170, PETALUMA, CA 94954 * 707.794.1242, EXT. 5
WWW.SSCRCD.ORG

June 28, 2012

Mr. Tom Lutterman
California Department of Water Resources
Division of Integrated Regional Water Management
Regional Planning Branch
PO Box 942836
Sacramento, CA 94236-0001

Subject: ***Endorsement of the Sonoma County Water Agency Local Groundwater Assistance Grant Application for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley***

Dear Mr. Lutterman,

The Southern Sonoma County Resource Conservation District (RCD) is pleased to provide this letter of support for the Local Groundwater Assistance Grant Application submitted by the Sonoma County Water Agency for an Enhanced Groundwater Recharge Pilot Study in the Sonoma Valley. This project is part of a logical progression of study, analysis, and collaboration in the Sonoma Valley in an effort to implement the Sonoma Valley Groundwater Management Plan (SVGMP), which was prepared in 2007 by a broad coalition of local stakeholders. Among other recommendations, the SVGMP identifies groundwater recharge through both groundwater banking of winter Russian River supplies in addition to local stormwater as a primary strategy to enhance the sustainability of the Sonoma Valley Groundwater Basin. In addition, the Enhanced Groundwater Recharge Pilot Study will increase the monitoring of groundwater conditions (water level and quality) associated with an area of groundwater depression.

The proposed project will build upon work accomplished between 2009 and 2011 under a previous LGA grant in which monitoring wells were installed and a groundwater recharge mapping project was successfully completed. For example, the results of the recharge mapping project are being used to identify areas to investigate stormwater recharge, an important component of the Enhanced Groundwater Recharge Pilot Study. Technical work to date strongly suggests that the existing field data and the groundwater model need to be augmented substantially before proceeding to implement significant capital projects aimed toward sustaining this resource. Thus it is important that the data gathering and analysis efforts under the Enhanced Groundwater Recharge Study take priority so that we can develop a better understanding of the parameters and dynamics of the existing resource. The application for a grant to fund 1) increasing groundwater monitoring, and 2) developing a better understanding of recharge in the Sonoma Valley, which will provide data to improve the

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Sonoma Valley groundwater model, are all sound next steps in the implementation program. Each of these programs is supported by robust stakeholder involvement through the SVGMP.

The RCD supports the Sonoma County Water Agency in seeking financial assistance from the State of California to execute this next step in collaboratively studying and monitoring groundwater recharge in the Sonoma Valley to manage and enhance a sustainable Sonoma Valley Groundwater Basin. The RCD plans to continue to participate collaboratively in the SVGMP implementation efforts to ensure a sustainable groundwater resource for the future in the Sonoma Valley.

Sincerely,

Kara Heckert
Executive Director

cc: Jay Jasperse

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